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Yosemite
Needle Miner

PLAN FOR APPRAISING RESULTS OF CONTROL AND
EXTENT OF INFESTATION OUTSIDE THE CONTROL AREA

LODGEPOLE NEEDLEMINER PROJECT - 1953
YOSEMITE NATIONAL PARK

At the present time, we have only general information on the intensity and extent of the infestation in the Park. From aerial observations, it appears that some 45,000 acres are infested. More precise information is needed in both these phases and it is proposed to obtain this information in the following manner.

1. Intensity of Infestation in Control and Check Area

Under the proposed plan for control this year, only the area of highest recreational use will be treated. This appears to be the general area around Tenaya Lake and Tuolumne Meadows. An intensive ground survey is proposed in this area to obtain population estimates and intensity of defoliation.

A preliminary study of population sampling has been made using units of 10, 20, 50 and 100 needles in each. From this study it appears that the 10-needle unit is the most efficient sample size. We have decided that our acceptable sampling error will be 15 per cent at the 95 per cent confidence level. Under this limit, a total sample of 400 units of 10 needles each will be needed. It is proposed to take 4 sample units from each of 100 trees. The trees will be selected at random and 4 tips from each tree will also be selected at random at about 12 feet from the ground. These will be obtained by using tree pruners mounted on bamboo or aluminum-jointed poles. The samples will be used to determine both population density and amount of defoliation. The information on defoliation will be much more precise than for population. The expected sampling error on defoliation will be about 7 per cent. After the larvae population samples are taken from each, the tips will be saved and caged for emergence records in units of 20 tips per cage. The purpose of the caging work is to get an estimate of moth population. The same procedure will be followed for the check area.

The effectiveness of the spray will be determined by making a post-control survey after mining by the young larvae has commenced and comparing the number of successfully mined needles on the control area with those on the check. The sampling procedure will be somewhat the same as above. This will be done as late in the season as possible. The modifications for this sampling will be that the twigs will be brought into the laboratory for examination because binoculars will be needed to locate the larval mines.

2. Extent of Infestation Area

The extent of the infestation outside the treated and check areas will be determined from a ground reconnaissance after the intensive sampling of population on the latter is completed. Three degrees of defoliation will be recognized and mapped, light, medium and heavy. Light, 1 to 25 per cent of needles

mined; medium, 25 to 50 per cent mined; heavy, over 50 per cent of needles mined. All areas of lodgepole pine which show signs of defoliation from the air will be ground checked and mapped.

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